MODE 3 COMMON EQUIPMENT INSTALLATION AND PRETEST

This Section provides procedures to install and pretest the ITT D448 Mode 3 common equipment.

This Section has been reissued to correct Chart 3, Step 17 Requirement and to include information on the handling of NMOS-equipped units.

Installation consists of plugging the units into their appropriate slots. Pretest for the common equipment consists of checking the voltage levels on the power converter unit (PCU) and looping each digroup while checking the alarm indicators on the trunk processor and alarm (TPA) units and other common equipment units.

WARNING: This equipment contains static-sensitive (NMOS) devices. Section ITTR-18-599 contains handling instructions for MOS-equipped units.

Note: There are no field-selectable options on the common equipment units.

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CHART 1

INSPECTION

APPARATUS

None

STEP	PROCEDURE
1	Remove equipment from shipping carton(s).
2	Perform an inventory to verify that all equipment listed on packing list is present.
3	Inspect the equipment for shipping damage. Report any damage to carrier immediately.

CHART 2

POWER CONVERTER UNIT INSTALLATION

APPARATUS:

1—Volt-ohm meter (VOM) (WE KS-14510, Triplett 630, or equivalent)

Standard hand tools as required (see Section ITTR-18-400)

STEP	PROCEDURE
1	At fuse, alarm and distribution panel (FADP) or power board, remove fuses for – 48V power source (to multiplex terminal) and 20-Hz ringing source.
2	Verify that connector keys are installed in multiplex shelf common equipment connectors as shown in Table A and Fig. 1.

TABLE A

23-INCH SHELF		19-INCH SHELF	
CONNECTOR	KEY SLOTS	CONNECTOR	KEY SLOTS
J1C/J2C	19, 54	J1C/J2C	19, 54
J3C	23, 58	J3C	27, 62
J4C	8, 43	J4C	13, 48
J5C	5, 40	J5C	22, 57
J6C	18, 53	J6C	21, 56
J7C	15, 50	J7C	8, 43
J8C	15, 50	J8C	23, 58
J9C	27, 62	J9C	5, 40
J10C	13, 48	J10C	18, 53
J11C	21, 56	J11C	15, 50
J12C	27, 62	J12C	15, 50
J13C	13, 48	J13C	27, 62
J14C	22, 57	J14C	13, 48
J15C	21, 56	J15C	21, 56
		J16C	9, 44

3	Install PCU in connector J1C/J2C of multiplex shelf.
4	Secure PCU in slot by tightening screw on front panel.
5	Replace fuses removed in Step 1.
6	Verify that PWR FAIL LED on PCU is off.

Note: If PWR FAIL LED on PCU is on, disengage PCU from its connectors and reinstall it. (Screw must be loosened and PCU released from connector to disengage. To reinstall, repeat Steps 3 and 4.) If LED remains on, check for – 48V on – 48V and GND test points on PCU. If – 48V is not present, restore it. If – 48V is present, replace PCU.

CHART 2 (Cont)

STEP	PROCEDURE

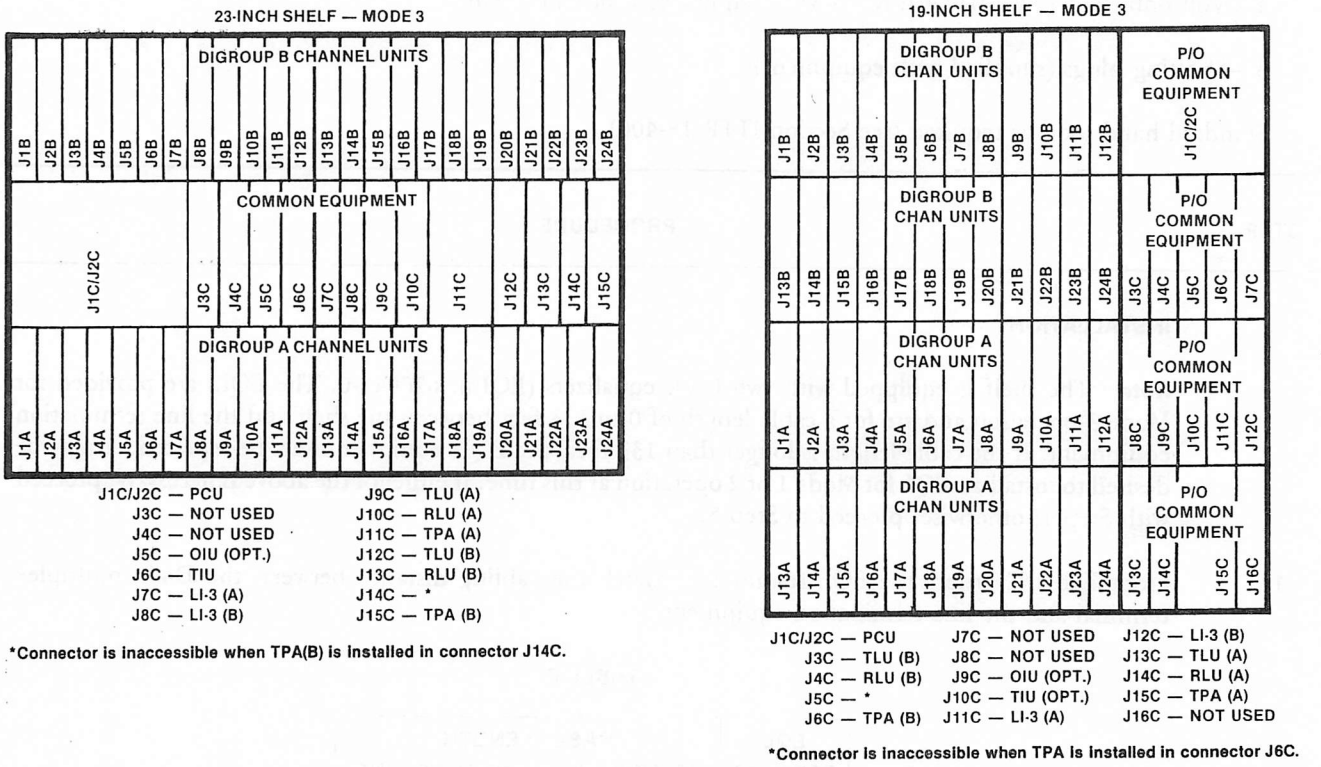


Fig. 1—D448 Multiplex Terminal, Mode 3 Operation

7 Connect VOM, set to volts dc scale, across PCU test points listed in Table B and GND test point to verify proper output voltage.

TABLE B

TEST POINT	REQUIREMENT
+7V	+6.00 to +8.00 Vdc
−2.5V	−2.25 to −2.75 Vdc
−5V	−4.75 to −5.25 Vdc
−7.5V	−7.25 to −7.75 Vdc
−10V	−9.50 to −10.50 Vdc
−17V	−16.0 to −18.0 Vdc
−48V	−42.0 to −56.0 Vdc

8 If 20-Hz ringing voltage is connected to multiplex terminal, connect VOM set to volts ac scale across GND and RNGA test points on PCU.

Requirement: VOM reads value of office ringing supply.

9 Repeat Step 8 using RNGB instead of RNGA.

CHART 3

COMMON EQUIPMENT INSTALLATION AND PRETEST

APPARATUS:

1—Volt-ohm meter (VOM) (WE KS-14510, Triplett 630, or equivalent)

3—Shorting plugs (supplied with equipment)

Standard hand tools as required (see Section ITTR-18-400)

STEP	PROCEDURE

INSTALLATION

Note: The shelf is equipped with two C.O. equalizers (EQLs), 628045-0. The EQLs are provided for Mode 3 operation and are for a cable length of 0 to 133 feet between the shelf and the line termination equipment. If the cable length is longer than 133 feet, the EQLs equipped must be replaced. It may be desired to install an EQL for Mode 1 or 2 operation at this time. If either of the above is necessary, proceed with Step 1; otherwise, proceed to Step 5.

1 From Table C, select the EQL required to match the cabling distance between the D448 multiplex terminal and the line termination equipment.

TABLE C

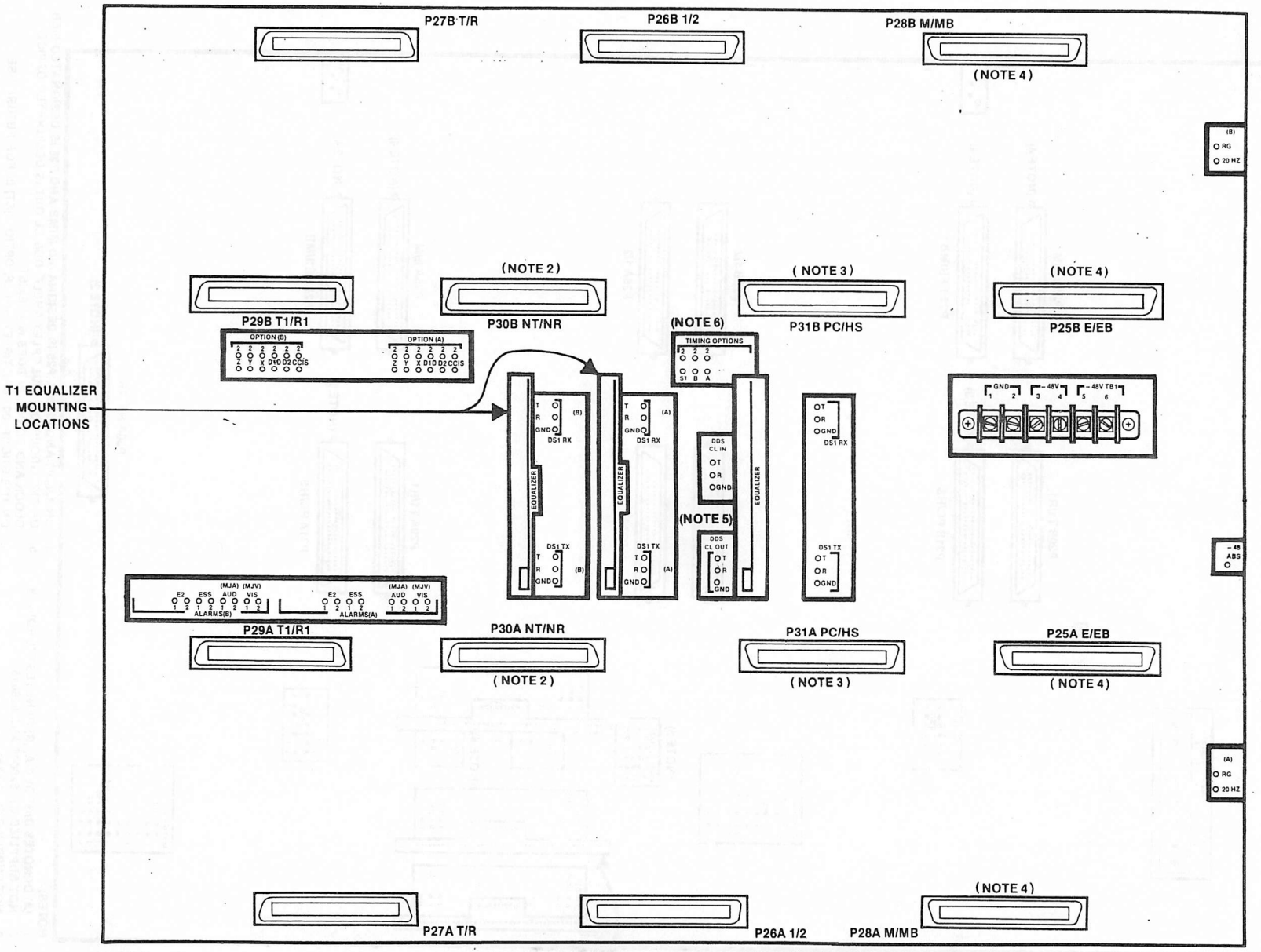
EQL CATALOG NO.	CABLE LENGTH (MULTIPLEX TERMINAL TO LINE TERMINATION EQUIPMENT)
628045-0	0-133 ft (0-41 m)
628045-1	134-267 ft (42-81 m)
628045-2	268-400 ft (82-122 m)
628045-3	401-533 ft (123-162 m)
628045-4	534-655 ft (163-200 m)

2 Remove rear cover of multiplex shelf.

Note: Refer to Fig. 2 while installing EQL. The EQL is mounted with its component side to the left.

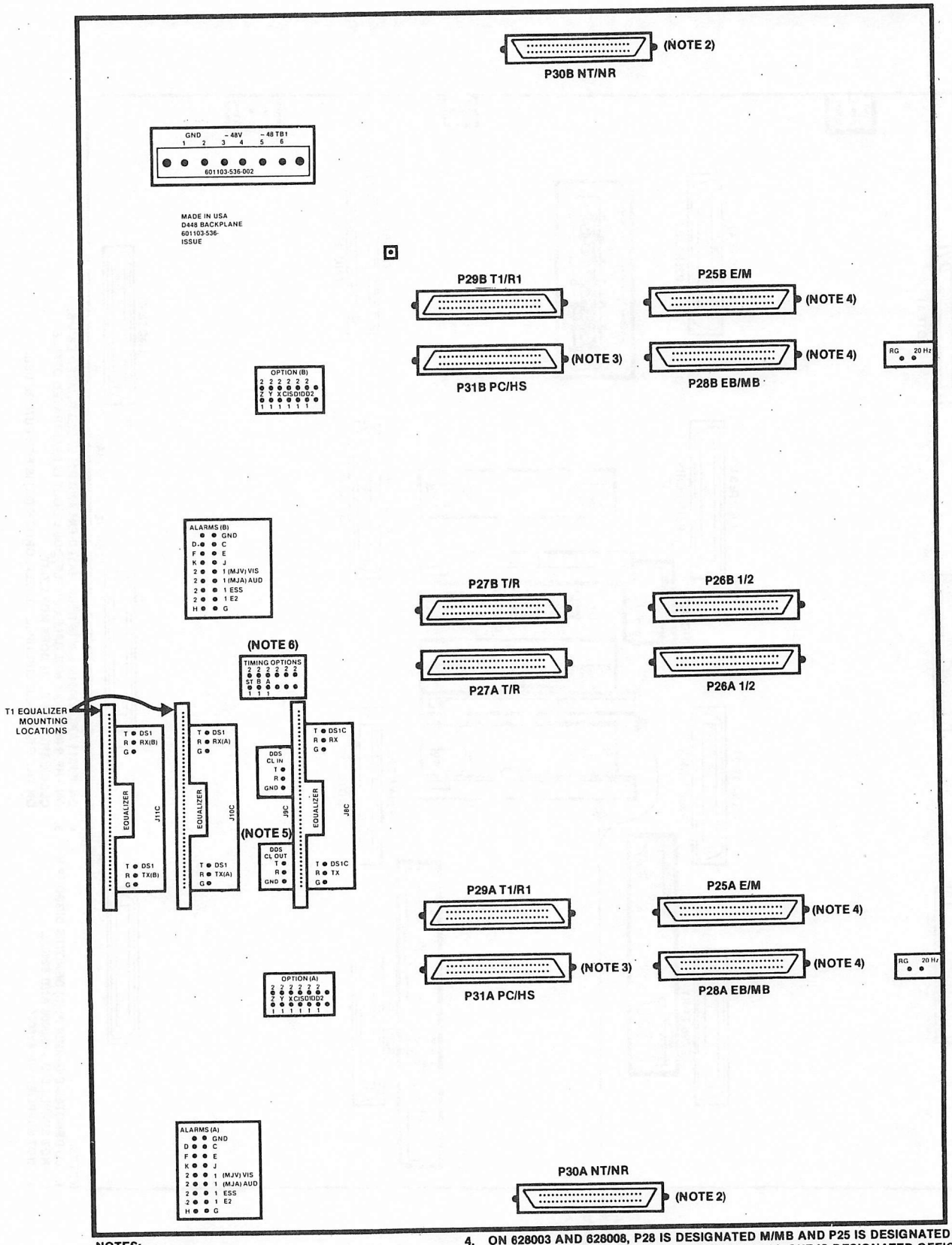
3 Install EQL in accordance with Step 4.

4 Install the EQL for Digroup A on the last four pins of the right-hand row of connector J7C (23-inch shelf) or J11C (19-inch shelf), and secure it to the backplane with the two screws provided. Install the EQL for Digroup B on connector J8C (23-inch shelf) or J12C (19-inch shelf) in the same manner as the EQL for Digroup A was installed.



NOTES:
1. (A) DENOTES DIGROUP A; (B) DENOTES DIGROUP B.
2. NOT SUPPLIED ON 628005 AND 628015.
3. NOT SUPPLIED ON 628005.
4. ON 628011 AND 628015, P28 IS DESIGNATED E/M AND P25 IS DESIGNATED EB/MB.
5. ON THE GROUP -001 MULTIPLEX SHELF, DDS CL OUT IS DESIGNATED OFFICE CLOCK AND DDS CL IN DOES NOT EXIST.
6. ON THE GROUP -003 MULTIPLEX SHELF, OPTION [ST] IS FOR FUTURE USE.

Fig. 2A—EQL Locations for 23-Inch Shelf



NOTES:
1. (A) DENOTES DIGROUP A; (B) DENOTES DIGROUP B.
2. NOT SUPPLIED ON 628008 AND 628018.
3. NOT SUPPLIED ON 628008.
4. ON 628003 AND 628008, P28 IS DESIGNATED M/MB AND P25 IS DESIGNATED E/EB.
5. ON THE GROUP -001 MULTIPLEX SHELF, DDS CL OUT IS DESIGNATED OFFICE CLOCK AND DDS CL IN DOES NOT EXIST.
6. ON THE GROUP -003 MULTIPLEX SHELF, OPTION [ST] IS FOR FUTURE USE.

Fig. 2B—EQL Locations for 19-Inch Shelf

CHART 3 (Cont)

STEP	PROCEDURE

Note 1: A third EQL (DSX1C) may be mounted on connector J5C (23-inch shelf) or J9C (19-inch shelf) if conversion to T1C operation is anticipated in the future. The DSX1C equalizer is not required for Mode 3 operation. If required, it should be installed on connector J5C (23-inch shelf) or J9C (19-inch shelf) as described in Step 4.

Note 2: As each common equipment unit is inserted in Step 5, the PWR FAIL LED on the PCU should remain off. If it turns on, it indicates that the overvoltage or overcurrent protection circuitry in the PCU has been activated, and the common equipment unit that caused the activation may be faulty and should be replaced. If the protection circuitry is activated, the PCU can be reset by momentarily removing it from its connector and then reinserting it. As soon as a TPA unit is inserted, the alarm cutoff (ACO) switch should be pressed.

Note 3: The following sequence applies when the shelf is being equipped with both digroups. If only one digroup is installed initially, the sequence for that digroup should be followed, and the information for the other digroup simply disregarded.

5 Install the common equipment units in the sequence indicated in Table D.

TABLE D

UNIT	PART NO.	CONNECTOR*	
		23-INCH SHELF	19-INCH SHELF
Office Interface Unit (OIU/LT)†‡	628090	J5C	J9C
Office Interface Unit (OIU/DDS)‡	628095	J5C	J9C
Test Interface Unit (TIU)†	628455	J6C	J10C
Line Interface, Mode 3 (LI-3) for Digroup A	628060	J7C	J11C
Line Interface, Mode 3 (LI-3) for Digroup B	628060	J8C	J12C
Transmit Logic Unit (TLU) for Digroup A	628020	J9C	J13C
Transmit Logic Unit (TLU) for Digroup B	628020	J12C	J3C
Receive Logic Unit (RLU) for Digroup A	628025	J10C	J14C
Receive Logic Unit (RLU) for Digroup B	628025	J13C	J4C
Trunk Processor and Alarm (TPA) Unit for Digroup A	628030	J11C	J15C
Trunk Processor and Alarm (TPA) Unit for Digroup B	628030	J15C	J6C

*Connector positions are shown in Fig. 1.
†This unit is optional. TIU is supplied with multiplex shelves, 628001, 628003, 628005, and 628008.
‡If this unit is to be installed, strap between pins 18 and 53 must be cut.

6 Before proceeding with the remainder of this chart, channel units should have options selected and be installed in accordance with Section ITTR-18-440 and/or ITTR-18-441.

7 Check status of LOOP LED on each TPA unit. If on, press LOOP button on associated TPA unit to remove from loop condition.

CHART 3 (Cont)

STEP	PROCEDURE

8 Check status of TP MEM button on each TPA unit. If in, press to release.

9 Insert a shorting plug in the LOOP test points on LI-3.

Requirement: All indicators on common equipment, except LOOP LED on each TPA unit, should be off. If not, refer to Section ITTR-18-533 for alarm trouble location procedures.

10 Connect VOM, set to volts dc scale, across PCU test points listed in Table E and GND test point to verify proper output voltage.

TABLE E

TEST POINT	REQUIREMENT
+7V	+6.00 to +8.00 Vdc
−2.5V	−2.25 to −2.75 Vdc
−5V	−4.75 to −5.25 Vdc
−7.5V	−7.25 to −7.75 Vdc
−10V	−9.50 to −10.50 Vdc
−17V	−16.0 to −18.0 Vdc
−48V	−42.0 to −56.0 Vdc

PRETEST

Note 1: If any requirement during pretest is not met, refer to Section ITTR-18-533 for trouble location procedures.

Note 2: Proceed to Step 11 if it is desired to pretest the alarm system on a single-ended (looped) basis. Proceed to Step 25 if it is desired to pretest the alarm system on an end-to-end basis and if the far-end terminal is an ITT D448. Proceed to Step 37 if it is desired to pretest the alarm system on an end-to-end basis and if the far-end terminal is anything other than an ITT D448. Proceed to Step 46 if it is not desired to pretest the alarm system.

A. Single-Ended Alarm Pretest

Note: The LOOP LEDs on each TPA unit remain on throughout this test.

11 On TPA unit for Digroup A, insert shorting plug in FTP test points.

Requirement: TPA unit CGA counter is incremented and after a delay of 2.5 seconds or 450 milliseconds (depending on option selection), RMA and TPA indicators on TPA unit turn on.

12 On TPA unit for Digroup A, press ACO button.

Requirement: On TPA unit, ACO LED turns on.

CHART 3 (Cont)

STEP	PROCEDURE
13	On TPA unit for Digroup A, press LOOP button. ***Requirement:*** On TPA unit, RMA LED turns off.
14	On TPA unit for Digroup A, remove shorting plug from FTP test points.
15	On TPA unit for Digroup A, press LOOP button. ***Requirement:*** On TPA unit, RMA LED turns on. After a delay of 12.5 seconds; RMA, ACO, and TPA indicators turn off indicating that alarm has cleared.
16	On TPA unit for Digroup A, press TP MEM button.
17	Release TLU for Digroup A from its connector. ***Requirement:*** On TPA unit for Digroup A, CGA counter is incremented immediately. After a delay of 2.5 seconds or 450 milliseconds (depending on option selection); LCA, RMA, TPA, and TP MEM indicators on TPA unit for Digroup A turn on; FR LOSS LED on RLU for Digroup A turns on.
18	Reinsert TLU in its connector. ***Requirement:*** LCA LED on TPA unit and FR LOSS LED on RLU turn off immediately. After a delay of 12.5 seconds; RMA and TPA indicators turn off, indicating that alarm has cleared.
19	On TPA unit for Digroup A, release TP MEM button. ***Requirement:*** On TPA unit, TP MEM LED turns off.
20	Release RLU for Digroup A from its connector. ***Requirement:*** On TPA unit for Digroup A, CGA counter is incremented immediately. After a delay of 2.5 seconds or 450 milliseconds (depending on option selection), LCA and TPA indicators on TPA unit for Digroup A turn on.
21	Reinsert RLU in its connector. ***Requirement:*** On TPA unit for Digroup A, LCA LED turns off immediately and RMA LED turns on. After a delay of 12.5 seconds, RMA and TPA indicators turn off, indicating that alarm has cleared.
22	Release LI-3 for Digroup A from its connector. ***Requirement:*** On TPA unit, CGA counter is incremented immediately. After a delay of 2.5 seconds or 450 milliseconds (depending on option selection), LCA, RMA, and TPA indicators on TPA unit and FR LOSS LED on RLU turn on.

CHART 3 (Cont)

STEP	PROCEDURE

23 Reinsert LI-3 in its connector.

Requirement: LCA LED on TPA unit and FR LOSS LED on RLU turn off. After a delay of 12.5 seconds, RMA and TPA indicators on TPA unit turn off, indicating alarm has cleared.

24 Repeat Steps 11 through 23 for Digroup B.

Note: Proceed to Step 25 if it is desired to pretest the alarm system on an end-to-end basis and if the far-end terminal is an ITT D448. Proceed to Step 37 if it is desired to pretest the alarm system on an end-to-end basis and if the far-end terminal is anything other than an ITT D448. Proceed to Step 46 if it is not desired to pretest the alarm system on an end-to-end basis.

B. End-to-End Alarm Pretest with ITT D448 Terminal at Far End

Note: The system must be end-to-end non-alarmed operational including span line (transmission medium) to perform this test.

25 Designate near-end terminal as local terminal and far-end terminal as remote terminal.

26 At remote terminal LI-3, remove shorting plug from LOOP test points.

Requirement: At remote terminal; LCA, RMA, and TPA indicators on both TPA units turn on.

27 At local terminal LI-3, remove shorting plug from LOOP test points.

Requirement: At remote terminal, all indicators except TPA lamp turn off immediately. At local terminal, RMA and TPA indicators on both TPA units turn on. After a delay of 12.5 seconds, all indicators at both ends are off.

28 At local terminal TPA unit for Digroup A, insert shorting plug in FTP test points.

Requirement: At both terminals, CGA counter on TPA unit for Digroup A is incremented immediately. After a delay of 2.5 seconds or 450 milliseconds (depending on option selection) at local terminal, TPA lamp on TPA unit for Digroup A turns on; at remote terminal, RMA and TPA indicators on TPA unit for Digroup A turn on.

29 At local terminal TPA unit, remove shorting plug from FTP test points.

Requirement: After a delay of 12.5 seconds, all indicators at both ends turn off, indicating that alarm has cleared.

30 At local terminal, release TLU for Digroup A from its connector.

Requirement: At both terminals, CGA counter on TPA unit for Digroup A is incremented immediately. At both terminals, LCA and TPA indicators on TPA unit turn on; at remote terminal, FR LOSS LED on RLU turns on.

CHART 3 (Cont)

STEP	PROCEDURE
31	At local terminal, reinsert TLU, for Digroup A. ***Requirement:*** At both terminals, LCA LEDs turn off and RMA LEDs turn on immediately. At remote terminal, FR LOSS LED turns off immediately. After a delay of 12.5 seconds, all indicators at both ends turn off, indicating that the alarm has cleared.
32	At local terminal, repeat Steps 25 through 31 for Digroup B.
33	Reverse designations assigned in Step 25 and repeat Steps 28 through 32.
34	At local terminal, insert shorting plug in LOOP test points on LI-3.
35	At remote terminal, insert shorting plug in LOOP test points on LI-3.
36	Proceed to Step 44.
	C. End-to-End Alarm Pretest with Terminal Other Than ITT D448 at Far End ***Note:*** The system must be end-to-end non-alarmed operational including span line (transmission medium) to perform this test.
37	Unloop far-end terminal.
38	At LI-3, remove shorting plug from LOOP test points. ***Requirement:*** After a delay of 12.5 seconds, all alarm indicators at both ends are off.
39	At TPA unit for Digroup A, insert shorting plug in FTP test points. ***Requirement:*** TPA unit CGA counter is incremented immediately. After a delay of 2.5 seconds or 450 milliseconds (depending on option selection), TPA lamp on TPA unit turns on and far-end terminal goes into remote alarm.
40	At TPA unit for Digroup A, remove shorting plug from FTP test points. ***Requirement:*** After a delay of 12.5 seconds, all alarm indicators at both ends turn off, indicating that alarm has cleared.
41	Release TLU for Digroup A from its connector. ***Requirement:*** TPA unit CGA counter is incremented immediately. After a delay of 2.5 seconds or 450 milliseconds (depending on option selection), LCA and TPA indicators on TPA unit for Digroup A turn on and far end goes into local alarm.

CHART 3 (Cont)

STEP	PROCEDURE
42	Reinsert TLU for Digroup A. ***Requirement:*** On TPA unit for Digroup A, LCA LED turns off immediately. After a delay of 12.5 seconds, all alarm indicators at both ends turn off, indicating that alarm has cleared.
43	Repeat Steps 39 through 42 for Digroup B.
	LOOPED OPERATION
44	At far end, loop terminal.
45	At LI-3, insert shorting plug in LOOP test points.
46	The terminal is now operating in a looped condition. It should be left in this condition until the channel unit tests (Section ITTR-18-443, ITTR-18-445 and/or ITTR-18-447) are completed, if they are required, or until the channels are placed in service.